UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

May 21, 2010

Colonel Richard J. Muraski
District Engineer, Fort Worth District
U.S. Army Corps of Engineers
819 Taylor Street
Fort Worth, TX 76102

Dear Colonel Muraski:

In accordance with the Environmental Protection Agency's (EPA) responsibilities under Section 309 of the Clean Air Act, Section 102 of the National Environmental Policy Act (NEPA), Section 404 of the Clean Water Act, and the Council on Environmental Quality's NEPA implementing regulations, EPA has reviewed the Draft Environmental Impact Statement (DEIS) for the proposed Lake Columbia Regional Water Supply Project in Cherokee and Smith Counties, Texas. Based on our review of the DEIS, EPA has rated the DEIS as Environmentally Unsatisfactory – Inadequate, or EU-3.

The rating "Environmentally Unsatisfactory" (EU) indicates that our review has identified adverse environmental impacts that are of sufficient magnitude that the proposed action must not proceed as proposed. The numeric portion of the rating (3) indicates the DEIS does not present adequate information for the EPA to fully assess the environmental impacts that should be avoided in order to fully protect the environment or EPA identifies reasonably available alternatives which could reduce the environmental impacts of the action. We have enclosed detailed comments outlining our issues more completely.

The Angelina & Neches River Authority proposes to construct, operate, and maintain a dam and reservoir known as Lake Columbia (the "Project") on Mud Creek, a tributary of the Angelina River, in Cherokee and Smith Counties, Texas. The dam would impound 195,500 acre-feet of water extending approximately 14 miles upstream and inundate 10,133 acres at the conservation pool elevation. EPA is concerned that the Project would adversely impact 5,746 acres of waters of the U.S. associated with clearing, excavation, filling, and inundation of the reservoir site. The proposed project requires authorization for the discharge of dredged or fill material into waters of the U.S. under Section 404 of the Clean Water Act, and for work affecting navigable waters of the U.S. under Section 10 of the Rivers and Harbors Act of 1899.

The DEIS analysis is inadequate for the following reasons: 1) a limited review and analyses of alternatives (40 CFR 230.10(a)); 2) a lack of meaningful analysis regarding potential violation of State water quality standards (40 CFR 230.10(b)); 3) a lack of meaningful analysis regarding the potential for the proposed action to cause or contribute to significant degradation of waters of the U.S., specifically in light of secondary and cumulative effects (40 CFR 230.10(c)); and 4) insufficient mitigation to compensate for proposed impacts (40 CFR 230.10(d)).

EPA has determined that the upper Angelina River and its riparian wetland areas are "Aquatic Resources of National Importance" (ARNI) as that term is used in the EPA/Department of the Army Memorandum of Agreement under CWA Section 404(q). Factors used in identifying ARNIs include: economic importance of the aquatic resource, rarity or uniqueness, and/or importance of the aquatic resource to the protection, maintenance, or enhancement of the quality of the Nation's waters. The upper Angelina River provides a valuable habitat for many aquatic organisms and supports several federally listed fish species further downstream. In addition, the upper Angelina River is a valuable commercial and recreational resource, providing significant economic benefits to Texas' eastern communities. EPA Region 6 notified the District of our ARNI determination in the enclosed correspondence dated October 16, 2003, and November 23, 2003.

In reviewing the preferred alternative (Project) selected in the DEIS, EPA is concerned with the potential to cause large-scale and significant impacts to aquatic resources. Specifically, the Project is predicted to cause the loss of over 5,700 acres of waters of the U.S., including over 3,600 acres of bottomland hardwood wetlands on Mud Creek, which is a tributary of the Angelina River. This loss of wetlands, along with the lack of an adequate mitigation plan, represents environmental impacts that are of sufficient magnitude that EPA is concerned that the proposed action is likely to cause significant adverse impacts to aquatic resources of national importance and, as a result, the proposed project may not be fully consistent with CWA regulations. Our concerns regarding the nature and extent of anticipated impacts are increased by information suggesting that alternatives to the proposed project are available that would reduce adverse environmental effects and satisfy the Project's purpose. In addition, the methods used to assess existing wetland functions are not appropriate and do not provide an effective characterization of the potential impacts.

As a result of deficiencies in the NEPA and CWA review of the proposed project, EPA believes the Corps should develop additional, relevant technical information, assess the availability of less damaging project alternatives, and evaluate more effective mitigation measures, and make this revised evaluation available for public comment in a revised DEIS. Fundamentally, the entire project should be reevaluated. The revised DEIS should include fully developed alternatives that are evaluated against the Project's stated purpose and need.

EPA will continue to work with you and the applicant to resolve the issues we have identified. If we are unable to resolve our concerns, this matter may be a candidate for referral to the Council on Environmental Quality for resolution. If you have any questions, please contact Cathy Gilmore of my staff at (214) 665-6766 or e-mail her at gilmore.cathy@epa.gov for assistance.

Sincerely,

John Blevins
Director
Compliance Assurance and
Enforcement Division

Enclosures

DETAILED COMMENTS
ON THE
DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR THE
LAKE COLUMBIA WATER SUPPLY RESERVOIR PROJECT
CHEROKEE AND SMITH COUNTIES, TEXAS
PREPARED BY
FORT WORTH DISTRICT U.S. ARMY CORPS OF ENGINEERS

Aquatic Resources of National Importance

Bottomland Hardwood wetlands located on the Upper Angelina River provide important habitat for an extensive variety of wetland dependent animal and plant species, including invertebrates, aquatic birds, amphibians, reptiles, mammals, and aquatic vegetation. In addition to serving as critical fish and wildlife habitat, project area wetlands also provide a suite of other important ecological functions. These wetlands protect and improve water quality by removing and retaining pollutants, temporarily store surface water, maintain stream flows, and support aquatic food webs by processing and exporting significant amounts of organic carbon. In riverine backwater wetlands, nutrients are stored within, and cycled among, four major compartments: (a) the soil; (b) primary producers such as vascular and nonvascular plants; (c) consumers such as animals, fungi, and bacteria; and (d) dead organic matter, such as leaf litter or woody debris, referred to as detritus. The transformation of nutrients within each compartment and the flow of nutrients between compartments are mediated by a complex variety of biogeochemical processes associated with primary production and decomposition. These biogeochemical processes and their ability to support the rich array of flora and fauna found in Bottomland Hardwood wetlands are directly linked to maintenance of the spatial extent, depth, frequency, and duration of time riverine backwater wetlands in the project area are inundated.

The area's Bottomland Hardwood wetlands permanently remove or temporarily immobilize elements and compounds that are imported to the wetland from various sources, but primarily via the flood cycle. Elements include macronutrients essential to plant growth (e.g., nitrogen, phosphorus, and potassium) as well as heavy metals (zinc, chromium, etc.) that can be toxic at high concentrations. Compounds include pesticides and other imported materials. The primary benefit of this function is that the removal and sequestration of elements and compounds by wetlands reduces the load of nutrients, heavy metals, pesticides, and other pollutants in rivers and streams. This often translates into improved water quality and aquatic habitat in adjacent or down gradient rivers and streams.

The ability of Bottomland Hardwood wetlands to maintain a characteristic plant community is important because of the intrinsic value of the plant community and the many attributes and processes of wetlands that are influenced by the plant community. For example, primary productivity, nutrient cycling, and the ability to provide a variety of habitats necessary to maintain local and regional diversity of animals are directly influenced by the plant community. Due to the inundation by nutrient rich surface water,

diverse assemblages of plants grow in riverine backwater wetlands and contribute to the primary production of these ecosystems. The growth of different plant communities as a result of variable hydrologic regimes and topography contributes to the uptake and release of nutrients and provides many layers of potential habitat (i.e., litter layer to canopy) for the hundreds of wildlife species which utilize these wetlands. In addition, the plant community of river connected wetlands such as those in the Upper Angelina River influences the quality of the physical habitat, nutrient status, and biological diversity of downstream systems.

A broad array of fish and wildlife species utilize the Bottomland Hardwood wetlands in the project site during some part of their life cycles. Terrestrial, semi-aquatic, and aquatic animals use these wetlands extensively. These wetlands provide important habitat for a diversity of organisms, are sites of high levels of secondary production, and are essential in the maintenance of complex trophic interactions. Habitat functions span a range of temporal and spatial scales. For example, invertebrate communities utilize the organic matter generated in these wetlands as a food source and the vertical structure of the plant community as refugia from flooding. Amphibian and reptile species use the wetlands for breeding and foraging habitats and fish utilize floodplains for spawning, rearing, and foraging. Birds and mammals utilize the wetlands for food, cover, and nesting. Most wildlife and fish species found in wetlands in the Upper Angelina River depend on certain aspects of wetland structure and dynamics such as specific vegetation composition and proximity to other habitats, but of particular importance to the life cycles of these species is the periodic flooding or ponding of water associated with the hydrologic regime of Bottomland Hardwood wetlands.

The upper Angelina River and its riparian wetland areas are aquatic resources of national importance (ARNI). EPA Region 6 made this designation (ARNI) to the District in correspondence dated October 16, 2003, and November 23, 2003, respectively. Factors used in identifying ARNI include: economic importance of the aquatic resource, rarity or uniqueness, and/or importance of the aquatic resource to the protection, maintenance, or enhancement of the quality of the Nation's waters. The upper Angelina River provides a valuable habitat for many aquatic organisms and supports several federally listed fish species further downstream. In addition, the upper Angelina River is a valuable commercial and recreational resource, providing significant economic benefits to Texas's eastern communities.

The project site is a typical east Texas bottomland forest that supports many species of birds at all seasons. In particular, bottomland forests are important breeding grounds for many neo-tropical migrants such as warblers, vireos, thrushes, tanagers, orioles, and flycatchers. Migrants also heavily use them in spring and fall going to and from northern breeding grounds.

The habitat on the project site is structurally diverse. For example, there are overcup oak flats that are wet well into the summer with sparse understory, but closed canopy; areas with more open canopy and thick understory; and areas with wet meadows of sedges and rushes and scattered trees. Each area has different vegetative structure that

provides habitat for different species. For example, birds such as the Swainson's, hooded and Kentucky warblers feed and nest near the ground and require dense shrubs and understory in a mature forest. Others, such as the yellow-throated warbler, nest high in the canopy of mature forest. Still others such as the White-eyed vireo and the common yellowthroat use dense thickets of early successional shrub and saplings. The habitat diversity in the project area provides nesting areas for all these species.

In 2003, EPA staff observed 67 species of native birds on the project site, of which 36 species are neotropical migrant birds, including multiple sightings of northern parula, prothonotary warbler, yellow-throated warbler, Swainson's warbler, and Acadian flycatcher which are riparian or bottomland dependant birds. Many of the other bird species use riparian or wetland areas to a greater or lesser extent. Several neotropical migrants seen on the project site that have suffered significant long-term declines in their Texas breeding range, including the Swainson's warbler (Sauer, et al. 2003)[1]. The Swainson's warbler, of which two were found on the project site, is one of the rarest wood warblers in North America. It is "the least abundant of southern warblers except for Bachman's Warbler" (Meanley , 1971)[2]. In Texas and in most of its range (southeast U.S.), Swainson's is dependent on mature bottomland forests with dense understory for breeding habitat.

Several species observed on the project site are listed as Birds of Conservation Concern (U.S. Fish & Wildlife Service, 2002)[3]. These are birds that are vulnerable or have suffered significant population declines and may decline to where they need protection unless conservation measures are taken to help them. In addition, EPA has observed on the project site the tracks and sign of numerous other animals such as beaver, raccoon, alligators, eastern ribbon snake, broad-banded water snake, water moccasin, green tree frogs, and leopard frogs.

The value of bottomland hardwoods to wildlife is well documented. Wharton et at, (1982)[4] lists many species of salamanders, frogs, snakes, turtles, mammals, and birds that occur in floodplains of the southeast U.S. They state, "The floodplains provide a habitat continuum for a wide range of aquatic to terrestrial and aerial species."

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[1] Sauer, J.R., J.E. Hines, and J. Fallon. 2003. The North American Breeding Bird Survey, Results and Analysis. 1966-2002. Version 2003.1, USGS Patuxent Wildlife Research Center, Laurel, MD. http://www.mbr-pwrc.usgs.gov/bbs/bbs.html.

[2] Meanley, Brooke. 1971. Natural History of the Swainson's Warbler. North American Fauna Series, No. 69. U.S. Fish and Wildlife Service, Patuxent Wildlife Research Center.

[3] U.S. Fish and Wildlife Service, 2002. Birds of Conservation Concern 2002. Division of Migratory Bird Management, Arlington, VA. 99pp. http://migratory birds.fws.gov/reports/bcc2002.pdf

[4] Wharton, C.H., W.M. Kitchens, E.C. Pendleton, and T.W. Sipe. 1982. The Ecology of Bottomland Hardwood Swamps of the Southeast: A Community Profile. U.S. Fish and Wildlife Service, Biological Services Program, Washington, D.C. FWS/OBS-8137. 133pp.

A survey by Texas Parks & Wildlife Department (El-Hage and Moulton, 1998)[5] found 48 species of reptiles and amphibians that are aquatic, semi-aquatic or wetland dependent in the counties to be served by the project.

In a bottomland hardwood forest on the Angelina River 40 miles downstream from the project site, Shackelford and Conner (1996)[6] recorded 66 species of birds over a one year period (all four seasons), more than in a nearby upland pine-hardwood forest (63 species) or a pine forest (44). The majority were neotropical migrants (32 were found in the spring and 21 in summer). Two species, yellow-throated warbler and the northern parula were found only in the bottomlands.

Weller (1988)[7] found that shrub wetlands also provide significant bird habitat. On a 22-acre shrub swamp in the Trinity River floodplain 50 miles west of the project site, he found 50 species of birds, 12 of which were breeding, including prothonotary warbler, Acadian flycatcher, yellow-billed cuckoo, anhinga, white ibis, and seven species of heron and egrets. There are 144 acres of shrub wetlands listed for the reservoir site.

Compliance with the CWA Section 404(b)(1) Guidelines (Guidelines)

The DEIS describes and analyses the estimated environmental effects of two action alternatives and the no-action alternative, and is intended to satisfy the Corps' regulations for NEPA implementation as well as to serve as the basis for a decision regarding the project's compliance with the Clean Water Act (CWA) Section 404(b)(1) Guidelines, 40 CFR Part 230 (Guidelines). Compliance with the Guidelines requires that impacts to aquatic resources be first avoided and minimized, and compensatory mitigation should be used only for impacts that cannot be avoided or minimized. These requirements are essential to meeting the overall objective of the Clean Water Act to restore and maintain the chemical, physical and biological integrity of the nation's waters.

Alternative water supply options exist that would meet the basic project purpose while avoiding the impacts to Mud Creek, a tributary of the Angelina River. The DEIS analysis does not demonstrate compliance with the Guidelines due to: 1) a limited review and analyses of alternatives (40 CFR 230.10(a)); 2) a lack of meaningful analysis regarding potential violation of State water quality standards (40 CFR 230.10(b)); 3) a lack of meaningful analysis regarding the potential for the proposed action to cause or contribute to significant degradation of waters of the U.S., specifically in light of secondary and cumulative effects (40 CFR 230.10(c)); and 4) insufficient mitigation to compensate for proposed impacts (40 CFR 230.10(d)).

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[5] El-Hage, A. and D.W. Moulton. 1998. Evaluation of Selected Natural Resources in Angelina, Cherokee, Gregg, Nacogdoches, Rusk, and Smith Counties, Texas. Resource Protection Division, Texas Parks and Wildlife Department, Austin.

[6] Shakelford, Clifford E. and Richard N. Conner. 1996. Woodland Birds in Three Different Forest Types in Eastern Texas. Bulletin: Texas Ornithological Society. 29(1):1-17.

[7] Weller, Milton W. 1988. Bird Use of an East Texas Shrub Wetland. Wetlands 8:145-158.

40 CFR § 230.10(a) Alternatives Analysis

The scope of alternatives analyzed is too limited, and recommends that an array of new alternatives be considered and evaluated. These new alternatives include a smaller reservoir with water from either Toledo Bend Reservoir or groundwater wells, and no reservoir with a combination of groundwater blended with water from Toledo Bend Reservoir. Additionally, the DEIS does not adequately address water conservation measures and quantify how much water would be saved if such measures were implemented. These alternatives should be more fully developed and evaluated.

With regard to a comparison of the Lake Columbia and the Toledo Bend Alternatives, the DEIS clearly demonstrates that the Toledo Bend Alternative would have significantly less impacts to the aquatic environment. In fact, the Lake Columbia Alternative aquatic impacts are more than 350 times greater than those of the Toledo Bend Alternative. Total aquatic impacts for Lake Columbia are estimated at 5,747 acres. Of those 3,689 acres are forested wetlands, 1,518 acres are herbaceous wetlands, 144 acres are shrub wetlands and 0.5 acres are hillside bog. Also included are impacts to 70 miles of perennial streams and 39 miles of intermittent streams. Estimated impact from the Toledo Bend Alternative total 16.2 acres. In that amount, 10.7 acres are forested wetlands and 5.5 acres are herbaceous wetlands. Much of the Toledo Bend Pipeline Alternative calls for the use of existing highway right-of-ways which generally means environmental resources in such areas are of lesser quality due to the presence of human induced disturbances.

The DEIS notes that the 2003 EPA Lake Eastex Needs Analysis and Alternatives Evaluation may have underestimated the costs of the Toledo Bend Alternative by not fully accounting for elements such as terminal storage or storage at pumping stations. As a result, the DEIS asserts that the overall cost per 1,000 gallons of water from the Toledo Bend Alternative would be three times that of the proposed Lake Columbia project. However, the DEIS did not to clearly identify all the costs associated with the Lake Columbia project.

For example, the Lake Columbia Alternative will require a widening of U.S. Highway 79 and the construction of a 5,000-foot bridge over the lake as well as construction of a 1,000-foot bridge on State High 135 and realignment of the Union Pacific railroad paralleling FM 2064. It is not apparent that the costs for these actions are included in the overall cost of the Lake Columbia Project. Additionally, there is no description of or cost provided for the actual delivery systems or water treatment facilities that will be needed. For the DEIS to adequately evaluate the cost of alternatives, such major features that are necessitated or induced should be included in that analysis since public funds would be required to finance such features. The DEIS should also clarify whether the cost analysis for the Lake Columbia Alternative includes compensatory mitigation requirements.

The DEIS also does not adequately address water conservation measures and quantify how much water would be saved if such measures were implemented. EPA is

aware of many examples of localities that have successfully implemented water conservation measures at less cost than constructing new reservoirs. For example, the State of California's Water Plan concluded that the largest single new water supply available to meet growth needs over the next 25 years will be water efficiency.[8]

40 CFR §230.10(b) Water Quality Impacts

Adverse water quality impacts are well documented in the literature and include adverse effects on both the impounded areas and downstream reaches. The elimination of flow makes the impounded area unsuitable habitat for native fluvial species and the physical, chemical and biological health of the downstream reaches may be greatly impacted due to numerous changes, including the alteration of sediment regime, water and food transport downstream, increased temperature and nutrients and low dissolved oxygen. Two southeastern states (Tennessee and North Carolina) recently conducted studies addressing water quality impacts from impoundments.[9]

Dams change physical processes of riverine ecosystems by reducing natural flood peaks and frequency, and movements of nutrients, sediments, and organic matter. These changes in turn affect biological processes by reducing seed dispersal and regeneration. The "disruption of intermittent river flow by dams lead to decreases in downstream forest productivity and ecological services" leading to reduced forest regeneration and tree growth (Koslowski, 2002)[10]. Dams block fish migration. Flood peaks and frequency of overbank flooding downstream are generally reduced. Diversions and evaporation reduces downstream discharge. Groundwater recharge may be reduced, lowering water tables downstream. These changes reduce the active floodplain, and sediment is trapped by reservoirs. As a result, increased erosion can occur downstream as the stream tries to restore its natural bedload. Changes in flood regime can also result in a shift to more upland forest species. Delayed flooding may adversely affect feeding and reproduction of fish and terrestrial animals. Animals breeding near water may suffer losses of eggs and larvae, and many fish that have evolved with natural flooding regimes will be adversely impacted.

Floodplains can improve the quality of the water flowing over it during flood stages by acting as a filter and sink for sediment and pollutants. Nutrients can be assimilated by aquatic vegetation and algae (Wharton et aI., 1982)[11]. Much of the southern part of Tyler and adjacent suburbs are in the watershed of the proposed lake.

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[8] California State Water Plan. www.waterplan.water.ca.gov.

[9] http://www.tn.gov/environment/wpc/publications/pdf/isp_report.pdf and Selected Bibliography – Stream Impoundment Perspectives, North Carolina Division of Water Quality, June 2008.

[10] Kowalski, T.T., 2002. Physiological-Ecological Impacts of Flooding on Riparian Forest Ecosystems. Wetlands 22(3):550-561.

[11] Wharton, C.H., W.M. Kitchens, E.C. Pendleton, and T.W. Sipe. 1982. The Ecology of Bottomland Hardwood Swamps of the Southeast: A Community Profile. U.S. Fish and Wildlife Service, Biological Services Program, Washington, D.C. FWS/OBS-8137. 133pp

During rain events, streams receive urban runoff with its load of soil, fertilizers, pesticides, road oil, and other pollutants. Wetlands at the project site provide water quality benefits that would be lost if they were inundated by the project.

Bottomland floodplain forests are also important fishery habitat. The floodplain and the river are continuous during overbank flooding. At this time, many fish species use the floodplain for feeding and spawning. The inundated floodplain becomes a nursery during the early life stages of fish larvae. The leaf litter on the forest floor forms the basis of a detrital food chain that supports abundant invertebrates (worms, crustaceans, insect larvae, mollusks) that provide food for fish and other vertebrates. During floods, particulate organic matter from the floodplain is flushed into the river and supports the river channel ecosystem downstream (Wharton et aI., 1982)[12]. Mud Creek currently has a high diversity of native fish adapted to a river ecosystem, and that the proposed reservoir may result in a significant change in the fish community, and could also adversely impact fish communities downstream if the flow regime (high and low flows) is significantly altered.

Recognizing that there are large areas of bottomland forests between the proposed dam site and Sam Rayburn Reservoir, the Corps needs to provide an analysis of potential downstream impacts.

40 CFR §230.10(c) Significant Degradation

The Angelina & Neches River Authority (ANRA) proposes to construct, operate, and maintain a dam and reservoir known as Lake Columbia (the "Project") on Mud Creek, a tributary of the Angelina River, in Cherokee and Smith Counties, Texas. The dam would impound 195,500 acre-feet of water extending approximately 14 miles upstream and inundate 10,133 acres at the conservation pool elevation. What is of concern to the EPA is that the Project would adversely impact 5,746 acres of waters of the U.S. associated with clearing, excavation, filling, and inundation of the reservoir site. The proposed project requires authorization for the discharge of dredged and fill material into waters of the U.S. under Section 404 of the Clean Water Act, and for work affecting navigable waters of the U.S. under Section 10 of the Rivers and Harbors Act of 1899.

EPA is concerned that the project, as currently proposed, would likely cause or contribute to significant degradation of waters of the U.S. The impacts of greatest concern to the EPA include the potential for adverse changes to water quality, stream morphology and aquatic life due to changes in the hydrograph of Mud Creek and the Angelina River down to Sam Rayburn Reservoir due to the proposed action.

A fish survey found 24 species of fish in Mud Creek in the southern part of the project area. An Index of Biological Integrity (IBI) was calculated and resulted in a "High Aquatic Life Use" rating by the Texas Commission on Environmental Quality in 1996.

[12] Wharton, C.H., W.M. Kitchens, E.C. Pendleton, and T.W. Sipe. 1982. The Ecology of Bottomland Hardwood Swamps of the Southeast: A Community Profile. U.S. Fish and Wildlife Service, Biological Services Program, Washington, D.C. FWS/OBS-8137. 133pp

Another survey (EI-Hage and Moulton, 1998)[13] found 30 species of fish in Mud Creek. Anderson et al. (1995)[14] found that fish diversity in east Texas streams has declined from 1953 to 1986. The study also found that greater effort was needed to catch uncommon species in 1986 than 1953. These effects were partly attributed to the construction of many reservoirs that have modified the flow regimes of streams. They conclude that there is a "general state-wide trend in a reduction of lotic adapted taxa with narrow habitat requirements (darters, minnows, suckers, and catfishes) and increase in opportunistic species tolerant of variable habitat conditions."

Throughout the DEIS there are references to the project's direct and secondary impacts to stream morphology, water quality and aquatic life as minor, and that cumulative effects are similar to, or slightly greater than the direct and secondary effects. The impacts of this project, in combination with past and reasonably foreseeable actions, are significant and unacceptable to an aquatic resource of national importance. It is likely that the proposed project will have serious adverse effects on aquatic ecosystem diversity, productivity and stability of the Angelina River which is not analyzed sufficiently in the DEIS.

Additional wetland impacts resulting from reasonably foreseeable projected changes in land use, construction and development under the proposed action could result and thus should be evaluated and disclosed as cumulative impacts. A thorough analysis of these potential effects is necessary to gauge the overall proposed project impacts, to evaluate the availability of less damaging practicable alternatives and to determine the feasibility and appropriateness of mitigation.

40 CFR § 230.10(d) Mitigation

Pursuant to 33 CFR §332.4 and 40 CFR §230.94, *Compensatory Mitigation for Losses of Aquatic Resources (Mitigation Rule),* a compensatory mitigation plan must be submitted and approved by the Corps before issuance of an individual CWA Section 404 permit.

As proposed, the applicant's mitigation plan describes principal mitigation areas as on-site, near-site and off-site utilizing restoration and preservation. It is EPA's opinion that the proposed mitigation plan does not adequately address all impacts to aquatic resources and does not clearly identify the location and size of mitigation tracts, baseline assessments, appropriate mitigation actions (restoration and or enhancement measures), monitoring and success criteria. As such, the mitigation plan is not consistent with the requirements outlined in the joint EPA/Corps of Engineers Mitigation Rule.

[13]El-Hage, A. and D.W. Moulton. 1998. Evaluation of Selected Natural Resources in Angelina, Cherokee, Gregg, Nacogdoches, Rusk, and Smith Counties, Texas. Resource Protection Division, Texas Parks and Wildlife Department, Austin.

[14] Anderson, Allison A., Clark Hubbs, and Kirk O. Winemiller, and Robert J. Edwards. 1995. Texas Freshwater Fish Assemblages Following Three Decades of Environmental Change. The Southwestern Naturalist 40(3):314-321.

The Lake Columbia Project currently would impact a total of 5,746.5 acres of aquatic resources, making this one of the largest, if not the single largest, impact to aquatic resources within Texas since the inception of the CWA Section 404 regulatory program. As recognized in 33 CFR 332.4(c), "the level of detail of the mitigation plan should be commensurate with the scale and scope of the impacts." Given the scope of the impacts from the Lake Columbia Project, we believe that the proposed mitigation plan is more a conceptual framework than an actual plan that outlines the measures that will be taken to offset the adverse impacts. The proposed mitigation plan uses hypothetical and generalized scenarios with assumed conditions for determining mitigation credit and does not fully evaluate impacts to stream resources and downstream floodplain wetlands. The proposed mitigation plan outlines a schedule that is not consistent with the Mitigation Rule, and proposes that forested wetlands that will be inundated by the reservoir serve as mitigation for their own destruction. Additional major concerns include the misapplication of the HGM assessment method, failure to adequately provide for mitigation for stream impacts, unacceptable preservation ratios, and a reliance on "willing sellers" that will lead to fragmented and less effective mitigation.

Detailed comments on specific sections of the DEIS are presented below.

2.1.1.a. **Land and Flowage Easement Acquisitions**: The proposed mitigation plan states that the Angelina & Neches River Authority (ANRA) will purchase land around Lake Columbia up to an elevation of 318 feet NGVD and prohibit "unpermitted" development within this area. Additionally ANRA will purchase land between the 318 and the 326 NGVD and allow various activities to occur in these areas. Both areas or "zones" are likely to be dominated by uplands and given that development activities will occur in both zones, such areas would not provide aquatic function replacement or a significantly undisturbed buffer for which mitigation credit would be warranted.

2.1.1.b. Water Quality Regulations: ANRA should address all State and federal water quality standards and implement methods needed to comply with those standards in managing lands under its jurisdiction. These measures should offer no compensatory mitigation credits for impacts caused by the lake's development.

2.1.2 Analysis of Alternative Mitigation Approaches: The ANRA has proposed a "stepwise fashion" by first identifying and implementing mitigation measures on-site, followed next by near-site mitigation actions, and finally off-site actions in the vicinity of the Big Thicket National Preserve (BTNP). Two principle methods for mitigation are restoration and preservation. The Mitigation Rule, specifies in 33 CFR 332.3(b)(1), *Type and location of compensatory mitigation,***:** "When considering options for successfully providing the required compensatory mitigation, the district engineer shall consider the type and location options in the order presented in paragraphs (b)(2) through (b)(6) of this section." Parts (b) (2) through (b) (6) outline a preference sequence which begins with mitigation bank credits. Lake Columbia impacts would occur in the primary service area of at least one major bank. EPA recommends that ANRA first seek mitigation credit from approved banks.

The proposed mitigation plan states that the rationale for not utilizing approved mitigation bank credits is that there would be a fragmentation of mitigation. However, the proposed approach would provide even more fragmented mitigation since it would use lands from willing sellers as far away as Harden County (more than 130 miles from the impact site). The proposed mitigation plan also notes that utilizing approved mitigation bank credits would be difficult since ANRA has already made tentative commitments to secure off-site private lands associated with the BTNP. While it is unfortunate that these arrangements were made by the applicant before a final decision has been made by the Corps, we continue to recommend that the sequencing of mitigation location and credits be consistent with the current Mitigation Rule.

The proposed mitigation plan would not offset the potential impacts. As to the proposal for mitigation off-site at the BTNP, which is more than 100 miles from the project site, the BTNP is not an appropriate location for mitigating the potential impacts from the proposed Lake Columbia project. The DEIS does not adequately address the extent of banking credits available or fully evaluate the availability of lands adjacent to or nearby the project location. Furthermore, the ANRA plan to purchase lands by "willing buyer/willing seller agreements" is problematic in that ecological restoration is best served by selecting lands in large contiguous tracts and or linking significant ecologically functioning areas with substantial corridors. Using the willingness of a property seller to sell as the basis for selecting lands will result in a geographically fragmented mitigation effort.

2.2 Impact Site: The DEIS describes the jurisdictional resources to be impacted by the Lake Columbia project as 5,746.5 acres of waters of the U.S., including 3,689 acres of forested wetlands, 144 acres of shrub-scrub wetlands, 1,518 acres of herbaceous wetlands, 204,864 liner feet of intermittent streams, 370,128 linear feet of streams, 63 acres of open water, 0.5 acres of hillside bog and 14,256 liner feet of new channels. However no assessment of stream quality and function has been conducted by which to evaluate impacts or determine adequate stream mitigation. Without these assessments, the DEIS's impact analysis is inadequate.

2.3.3 Mitigation Site (off-site): Off-site mitigation should first occur as near to the project site as possible. The BTNP is not an appropriate location for implementing mitigation for this specific project. The DEIS does not demonstrate how mitigating at this location would offset ecological losses sustained at the project site. While technically parts of the BTNP are downstream from the impact site, it is more than 100 miles away. Placing mitigation over 100 miles from the impact site in scattered parcels from as yet undetermined willing sellers would not replace the ecological losses incurred at the project site. As stated earlier in these comments, ANRA's plans to purchase lands by "willing buyer/willing seller agreements", is problematic in that ecological restoration is best served by selecting lands in large contiguous tracts and or linking significant ecologically functioning areas with substantial corridors. The willingness of a property seller to sell is not an ecological reason for purchasing, and if such an approach was taken

mitigation lands would in all likelihood be geographically fragmented (ANRA's stated reason for not wanting to utilize numerous mitigation banks).

The DEIS states that the Texas Water Development Board (TWDB) has given a financial commitment, but funds would not be released until the 404 permit is issued. EPA was not able to determine what that financial commitment is or what ANRA has estimated as the amount needed to fully satisfy mitigating all unavoidable impacts caused by this project. A large irrigation/flood control project recently approved in Arkansas by the Corps of Engineers, Memphis District, is currently having difficulties meeting its mitigation targets due to the inability to purchase (from willing sellers) the required mitigation lands within the budget utilized in the planning and cost analysis. 33 CFR 332.3(n)(1), *Financial assurances,* states "The district engineer shall require sufficient financial assurances to ensure a high level of confidence that the compensatory mitigation project will be successfully completed…". EPA recommends that in order to ensure that the applicant fully meets its mitigation obligation should it receive a permit for this project, that the permit should include an enforceable condition that requires all land/easement purchases to be verifiably acquired prior to initiation of dam construction.

3.2 Assessment Methods: The wetland functional assessment method used to assess the project site was the HGM Interim assessment for both the Riverine Herbaceous/Shrub and the Riverine Forested habitat types. It was stated that only three functions of wetlands were evaluated. Such a limited assessment as provided in the DEIS does not adequately identify environmental impacts and potential mitigation needs. An important function of riverine wetlands, and one relevant to the impacts posed by a reservoir, is "export of organic carbon." Wetlands located in an active floodplain such as those in this project provide an important source of organic carbon. Dissolved and particulate organic carbon is the essential energy base for the aquatic food web. Reservoirs disrupt the flow of nutrients and sediments causing an imbalance in ecological processes downstream. Additionally, the DEIS does not utilize the HGM assessment method correctly in that HGM can only be used to assess specific wetland types for which it was developed. It appears that the DEIS has determined that the function of flood storage and removal/sequestration of nutrients by a reservoir are analogous to forested wetlands. However, there is no supporting evidence to equate the functions preformed by forested wetlands to that of water supply reservoirs and as such the assumed functional credits provided by the reservoir for flood storage and nutrient removal/sequestration are unverifiable. Also, 33 CFR 332.3(c)(2)(i) states, "Compensatory mitigation requirements determined through the watershed approach should not focus exclusively on specific functions (e.g., water quality or habitat for certain species), but should provide, where practicable, the suite of functions typically provided by the affected aquatic resource."

3.6 Existing Wildlife Usage: The DEIS characterizes the Bottomland Hardwood Forest as providing excellent habitat diversity. The Herbaceous wetlands are characterized as exhibiting relatively high species diversity and habitat structure. The Shrub-Scrub wetlands are also identified as increasing habitat diversity. EPA is concerned that no ecological or geomorphic assessment of the streams (ephemeral, intermittent and perennial) or ponds is presented in this part or in the mitigation plan. All aquatic

resources impacted by this project should be fully evaluated. Without a baseline assessment on ephemeral, intermittent and perennial streams and other waters (ponds), it is impossible to adequately develop or evaluate mitigation to replace the services of these resources. By not assessing these resources and providing measureable like-kind replacement for the suite of services that will be impacted, the mitigation proposal is inadequate.

4.1 Site Selection Process: The process described for mitigation site selection in the DEIS does not consider the larger issue of fragmentation of habitats and appears to look for potential "up-lift" on a specific tract. Each tract should be evaluated for restoration potential, and that only areas that would allow for the formation of large contiguous tracts of similar habitats should be considered along with replacing the suite of functions.

The DEIS gives examples of potential opportunities that exist in Mud Creek for wetlands restoration. These examples and the accompanying calculations are assumed to be presented as an example and cannot be used as a basis for future mitigation calculations. Additionally, the examples typically show a sub-index after restoration with a very high functioning index score especially for forested vegetation. Bottomland hardwoods typically require a minimum of 20 – 25 years to reach maturity and as such these restoration areas would not reach that level of function immediately after planting. Temporal loss of wetland functions, i.e., that time between the loss and that time that mitigation lands begin to fully function, should be addressed in all mitigation calculations.

4.2.1. Onsite: EPA questions the findings of the field evaluation of fringe wetland development. The DEIS states that the Corps and its EIS contractor conducted a field evaluation of fringe wetland development in several representative East Texas reservoirs and estimated that 1,195 acres of fringe wetlands will develop in certain shallow, gently sloping portions of the reservoir. ANRA estimates that 1,195 acres of fringe wetlands will provide 801 Functional Credit Units (FCUs) towards maintenance function for herbaceous wetlands. EPA's first concern is that lacustrine fringe is an out-of-kind wetlands type and not a diminishing resource as is riverine herbaceous wetlands, and therefore it would not be environmentally preferable to riverine herbaceous wetlands. Additionally, the Riverine HGM cannot be used to assess or compare lacustrine fringe to riverine herbaceous wetlands. EPA is concerned that the assumption made in the DEIS that lacustrine fringe will naturally appear over an undetermined period of time in various locations around the lake because other reservoirs in East Texas have various amounts of fringe wetlands is not supported. Specific issues with the proposal are the lack of expected species composition, method for establishment, monitoring protocols and timeline for achieving mitigation success. Without such minimal requirements, and taking in to account that the type of habitat is out-of-kind, the 801 FCUs estimated by ANRA as mitigation credits should not be counted towards mitigation of project impacts.

d. According to the DEIS, the ANRA proposes to acquire 3,500 acres of land within the reservoir footprint with standing mature forest that would not be cleared and left to be inundated by the lake. ANRA proposes to take credit for 686 FCUs for mitigation

impacts to forested wetlands by claiming that such an area of timber would provide 20% of the function of a forested wetland having a functional capacities index (indices) (FCI) of 0.98. This assessment is not accurate, since HGM compares like habitat types. In this case, a riverine forested system is not the same as a large reservoir with submerged woody debris. More importantly, all the vegetation, including the trees, would die and begin to decay over time leaving no, or at best only a few remnant snags per acre. Since the mitigation type is non-sustainable and is out-of-kind (dead timber), there is no compensatory mitigation value to this aspect of the mitigation plan.

4.2.2. Near-site:

a. Continued flow in Keys Creek: For this proposal to be considered as compensatory mitigation for the Lake Columbia project it would require a binding contract with the City of Jacksonville for a minimal amount of flow for perpetuity. This would need to be made an enforceable condition of the permit to ensure compliance.

b. Stream buffers in the No Discharge Zone (NDZ): This element of the proposal (stream preservation) affords no replacement of stream functions. There is no assessment of amount or quality of each stream type including ephemeral streams that exists in the NDZ, nor is there an assessment of the preservation requirements found at 33 CFR 332.3(h).

c. Upstream Conservation Easement: This part of the proposal states that the ANRA may exercise the option to acquire up to 250 acres in the Mud Creek Corridor. The stated uncertainty of this element actually occurring or what amount of land that might be acquired makes this part of the mitigation plan impossible to evaluate.

d. Downstream Restoration: EPA concurs with the approach for restoring forested wetlands previously converted for other uses or degraded by past management practices. However, the assumptions made for the FCIs are hypothetical and have no merit in calculating actual mitigation credits. Specific locations and baseline assessments would have to be made and mitigation actions developed in order to calculate the FCIs. As to plans for preservation, EPA is concerned about relying on preservation, as preservation does not “replace” lost functions. Additionally, the applicant must demonstrate that resources proposed for preservation meet the requirements for preservation as stated in 33 CFR 332.3(h). Deed restrictions and easements on land (NDZ) meant to provide stream mitigation do not provide functional replacement and have no mitigation merit since the amount, type and quality have not been assessed nor have the streams that will be impacted by the project. Again, preservation would only be allowed if the resources meet the preservation requirements in 33 CFR 332.3(h).

4.2.3. Off-site: According to the DEIS, the applicant is proposing to purchase lands in the vicinity of the BTNP for both restoration and preservation. The BTNP is located in

southeastern Texas and is more than 100 miles from the project site. The BTNP is not an appropriate location for implementing mitigation for this project. EPA recommends that the mitigation guidance sequencing for location and type be followed in developing the mitigation plan. The applicant should look closer to the project impact site for mitigation banking credits and permittee-responsible mitigation opportunities. As stated earlier in our comments, ANRA's plans to purchase lands by "willing buyer/willing seller agreements," is problematic in that ecological restoration is best served by selecting lands in large contiguous tracts and or linking significant ecologically functioning areas with substantial corridors. Utilizing "willing sellers" as one of the principle factors for locating mitigation lands would likely result in highly fragmented tracts thus reducing the environmental up-lift.

According to the DEIS, the ANRA is proposing that a "more generous" ratio of 5:1 for preservation of wetlands would be utilized for land purchase around the BTNP because the BTNP is an ecologically important resource. However, the Mitigation Rule requires that for lands to be eligible for preservation they must meet the preservation requirements in 33 CFR 332.3(h). While there may be areas that would meet the preservation requirements adjacent to the BTNP, meeting those requirements simply allows the use of those lands for preservation and would not warrant a reduction in mitigation ratios.

Preservation of lands around the BTNP will not mitigate for the loss of streams at the project site. The DEIS provides no baseline assessments of type, amount and quality that have been performed on either the impact site or the vaguely proposed mitigation sites.

b. Hillside Bog: Credit for mitigating for the 0.5 acre impact to a Hillside bog must come from an EPA approved (signatory) mitigation bank with specific credits for such habitats.

Timing of Mitigation: According to the DEIS, the ANRA proposes to acquire mitigation lands and conduct the work necessary to balance the impacts within ten years of receiving the 404 permit for Lake Columbia. EPA does not concur with that proposal and the impacts posed by this project require a mitigation plan that will assure that there will be no significant degradation to the aquatic environment. Accordingly, prior to issuance of a permit, a mitigation plan must be developed that clearly identifies specific tracts including location, baseline assessments and proposed mitigation actions needed to replace lost functions and services. An enforceable requirement of the permit should be that once the project is authorized, mitigation measures must be tied to project construction timelines and that prior to initiation of dam construction, all lands identified on which mitigation will occur must have been secured (purchased or under enforceable easement) and specific mitigation plans are underway. EPA is not suggesting that the mitigation become fully functional prior to this time but rather that the bulk of the mitigation obligation (land acquisition and restoration actions) should be in place. 33 CFR 332.3(m), *Timing*, requires that "implementation of the compensatory mitigation

project shall be, to the maximum extent practicable, in advance of or concurrent with the activity causing the authorized impacts."

As presented in the DEIS, the mitigation plan does not adequately identify the amount, location and required mitigation measures needed to off-set project impacts. Instead, it presents hypothetical measurements for functional up-lift in generic locations, some of which EPA objects to since it does not follow the 404(b)(1) Guidelines for preference or sequencing and how such lands would be obtained. Other areas and types such as the lacustrine fringe and the flooded timber are out-of-kind, without specific implementation measures and reasonable timeline for establishment nor is a monitoring plan available to ensure the amount, quality and long term protection of the mitigation features.

EPA is concerned that the process by which the applicant proposes to purchase lands for restoration and preservation, given that reliance on willing sellers would likely result in a noncontiguous patchwork of fragmented compensation sites that cannot deliver the ecological benefits predicted by the DEIS.

5.0 Mitigation Work Plans and 5.1, Tree and Shrub Plantings: Both of these parts contain generalized statements and cannot be evaluated without specific locations being identified relative to soil types, extent and nature of the sites' hydrology or geographic appropriateness.

7.0 Performance Standards: Performance standards are important and must be included as part of the mitigation plan. However, without specific locations and specific hydrology and planting plans identified for each location, EPA contends it is impossible to fully evaluate the proposal for adequacy.

7.3 Functional Goals: Determining mitigation success is vital to ensuring that unavoidable impacts are fully offset. In cases where mitigation is restoration of forested lands, EPA recommends that monitoring and reporting of survival and species composition be done at years 3, 5, 10, 15, 20 and 25. EPA requests that prior to closure of the dam and at years 3 and 5 that an on-site interagency visit be conducted following the applicant's report to verify monitoring results and to discuss any corrective actions that may need to be addressed. At the latter of these three on-site reviews the agencies can decide if further on-site reviews are warranted.

8.0 Site Protection: According to the DEIS, the applicant proposes to convey lands it may purchase adjacent or proximate to the BTNP to the United States of America to become part of the preserve. Such conveyance would take place after it has been determined by the applicant that the restoration or other actions to benefit the land has been successful. Simple transfer of ownership would not alleviate the need to maintain and manage lands as required by the conditions of the permit for the life of the project. As such, long term management, including management cost must be addressed by the applicant and any future owner of the property. In cases of preservation, a condition baseline must be established and long term monitoring must be done to ensure that no degradation of condition occurs.

9.0 Monitoring Requirements: As indicated in our response to part 7.3 above, EPA requests that prior to closure of the dam and at years 3 and 5 an onsite visit by the resource agencies be made to validate early mitigation compliance.

10.0 Long-Term Management Plan: EPA recommends that all forested lands including stream restoration areas be monitored for periods up to 25 years as it takes at least that long to establish mature functioning hardwood systems. Specific timelines for monitoring must be made part of the enforceable permit conditions. The proposal by the applicant to periodically monitor the mitigation lands visually is inadequate as it is not verifiable. Additionally, lands that the applicant may wish to transfer to the BTNP must carry with it the mitigation success criteria and long term management requirements specific to the project for which it was acquired. Transferring lands to the Federal Government would not alleviate mitigation requirements on those lands.

Proposed Mitigation Plan Inadequacies: The DEIS does not address the mitigation needs for the impact to the downstream floodplain. The DEIS states on page 4-57 that the project will have an eight to sixteen percent (1,249 acre) reduction in the floodplain area, and on page 4-137 of the DEIS it estimates a potential affect of approximately seventeen percent of the downstream floodplain. Further, the DEIS states that the predicted reduction in the floodplain would not result in a detectable change in the forest species composition and adds that change would be "imperceptible" over the decades and not likely to affect forest stands beyond the 100-year floodplain, and if there were an affect, it would be a shift to a drier species assemblage at the edge of the floodplain. A 17 percent change in the downstream floodplain is significant. Furthermore, the DEIS underestimates the potential for impacts to floodplain wetlands downstream because it does not account for non-hydric soils that may contain unnamed hydric inclusions.

EPA recommends that a more detailed evaluation be conducted to accurately determine the extent and location of wetlands that would be impacted given the potential change in both duration and extent of downstream flooding. Once an estimate for un-named hydric inclusions can be made and included into an estimate for total wetland area of the affected floodplain, such impacts must be added to the overall impacts of the project and included in the mitigation plan. Additionally, the assumption made in the DEIS that wetlands in the 100 years floodplain are not driven by flooding should be substantiated by on-site elevation surveys.